CLAIMS:

1. A method to control air-fuel ratios in individual cylinders of an internal combustion engine with electromechanical valves, the method comprising:

operating at least an electromechanical valve in each cylinder combusting an air-fuel mixture during a cycle of said engine; and

correcting an air and fuel mixture supplied to each cylinder combusting an air-fuel mixture based on a desired air-fuel mixture in said each cylinder combusting an air-fuel mixture.

2. The method of Claim 1 wherein said correction of an air and fuel mixture supplied to said each cylinder is produced by adjusting electromechanical valve timing for said each cylinder combusting an air-fuel mixture.

3. The method of Claim 1 wherein said correction of an air and fuel mixture is produced by adjusting an amount of fuel injected into to said each cylinder combusting an air-fuel mixture.

4. The method of Claim 1 wherein said desired air-fuel mixture in said each cylinder is the same desired air-fuel ratio in each cylinder.

5. The method of Claim 1 wherein said desired air-fuel mixture in said each cylinder is a different desired air-fuel ratio in each cylinder.

6. The method of Claim 1 wherein said desired air-fuel mixture in said each cylinder is based on a cylinder bank of said engine.

7. A method for adjusting air-fuel ratio in internal combustion engine, the engine having at least a group of cylinders, with each cylinder of said cylinder group containing at least a valve that may be deactivated, the method comprising:

adjusting timing of said at least a valve that may be deactivated for at least a cylinder of said cylinder group, increasing a crank angle interval between combustion in at least a first cylinder and combustion in at least a second cylinder, for at least a bank of said engine; and

correcting an air and fuel mixture supplied to said at least a second cylinder, based on a desired air-fuel mixture in said second cylinder.

8. The method of Claim 7 wherein said engine includes a first and a second bank of cylinders.

9. The method of Claim 7 wherein said adjusting timing of said at least a valve that may be deactivated for at least a cylinder of said cylinder group increases the number of strokes in a cycle of said cylinder.

10. The method of Claim 7 wherein said adjusting timing of said at least a valve that may be deactivated for at least a cylinder of said cylinder group deactivates said cylinder.

11. The method of Claim 7 wherein said valve that may be deactivated is an electromechanical valve.

12. The method of Claim 7 wherein said valve that may be deactivated is a mechanically driven valve.

13. The method of Claim 7 wherein said correction of an air and fuel mixture supplied to said at least a second cylinder is produced by adjusting at least an electromechanical valve timing for said at least a second cylinder.

14. The method of Claim 7 wherein said correction of an air and fuel mixture is produced by adjusting an amount of fuel injected into to said at least a second cylinder.

15. A method to control air-fuel ratio in a cylinder of an internal combustion engine with electromechanical valves, the method comprising:

operating said internal combustion engine with at least one cylinder, said at least one cylinder having at least one electromechanical valve;

sampling at least an oxygen sensor positioned in the exhaust of said internal combustion engine, downstream of said at least one cylinder having at least one electromechanical valve, at least once each period associated with each combustion event of said at least one cylinder having at least one electromechanical valve;

generating a feedback correction signal associated with each combustion event of said at least one cylinder having at least one electromechanical valve, from said at least a sampled oxygen sensor; and

correcting at least a mixture of air and fuel supplied to said at least one cylinder, in response to said feedback correction signal associated with each combustion event of said at least one cylinder having at least one electromechanical valve, for achieving a desired air-fuel ratio in said at least one cylinder.

16. The method of Claim 15 wherein said corrected mixture of air and fuel is produced by adjusting timing of said at least one electromechanical valve.

17. The method of Claim 15 wherein said corrected mixture of air and fuel is produced by adjusting an amount of fuel injected into said cylinder.

18. The method of Claim 15 wherein a sampling location of said sampling of said oxygen sensor is based on at least a cylinder and valve mode of said at least one cylinder having at least one electromechanical valve.

19. A method for adjusting air-fuel ratio in internal combustion engine, the engine having at least a group of cylinders, with each cylinder of said cylinder group containing at least an electromechanical exhaust valve, the method comprising:

adjusting said at least an electromechanical exhaust valve timing based at least on an engine operating condition;

sampling at least a signal of at least an oxygen sensor positioned in the exhaust of said at least a group of cylinders, at least once each period associated with a combustion event of said each cylinder of said cylinder group containing at least an electromechanical exhaust valve;

generating at least a feedback correction signal from said sampled oxygen sensor signal for each cylinder of said cylinder group containing at least an electromechanical exhaust valve; and

correcting a mixture of air and fuel supplied to said each cylinder of said cylinder group containing at least an electromechanical exhaust valve, in response to said at least a feedback correction signal from said sampled oxygen sensor signal for each cylinder of said cylinder group containing at least an electromechanical exhaust valve, for achieving a desired air-fuel ratio in said each cylinder of said cylinder group containing at least an electromechanical exhaust valve.

20. The method of Claim 19 wherein said adjusted exhaust valve timing is retarded.

21. The method of Claim 19 wherein said adjusted exhaust valve timing is advanced.

22. The method of Claim 19 wherein said corrected mixture of air and fuel supplied to said each cylinder of said cylinder group containing at least an electromechanical exhaust valve is produced by adjusting timing of said electromechanical valves.

23. The method of Claim 19 wherein said corrected mixture of air and fuel is produced by adjusting an amount of fuel injected into said cylinder.

24. The method of Claim 19 wherein a sampling location of said sampling of said oxygen sensor is based on at least a cylinder and valve mode of said cylinder.

25. The method of Claim 19 wherein said corrected mixture of air and fuel is corrected by adjusting timing of said at least an electromechanical valve.

26. The method of Claim 19 wherein said corrected mixture of air and fuel is corrected by adjusting an amount of fuel injected into said cylinder.

27. The method of Claim 19 wherein said valve that may be deactivated is a mechanically actuated valve.

28. The method of Claim 19 wherein said valve that may be deactivated is an electromechanical valve.

29. A method for adjusting air-fuel ratio in internal combustion engine, the engine having at least a first and a second group of cylinders, with each cylinder of said first cylinder group and said second cylinder group containing at least an electromechanical valve, the method comprising:

in a first mode, adjusting timing of said at least an electromechanical valve for at least a cylinder of said first cylinder group, increasing a crank angle interval between combustion in at least a first cylinder and combustion in at least a second cylinder, for at least a bank of said engine;

correcting an air and fuel mixture supplied to said at least a second cylinder, based on a desired air-fuel mixture in said second cylinder;

in a second mode, adjusting timing of said at least an electromechanical valve for at least a cylinder of said second cylinder group, increasing a crank angle interval between combustion in at least a third cylinder and combustion in at least a forth cylinder, for at least a bank of said engine; and

correcting an air and fuel mixture supplied to said at least a forth cylinder, based on a desired air-fuel mixture in said forth cylinder.

30. The method of Claim 29 wherein said engine includes a first and a second bank of cylinders.

31. The method of Claim 29 wherein said adjusting timing of said at least an electromechanical valve for at least a cylinder of said first cylinder group increases the number of strokes in a cycle of said at least a cylinder of said first cylinder group.

32. The method of Claim 29 wherein said adjusting timing of said at least an electromechanical valve for at least a cylinder of said first cylinder group deactivates said at least a cylinder of said first cylinder group.

33. The method of Claim 29 wherein said adjusting timing of said at least an electromechanical valve for at least a cylinder of said second cylinder group increases the number of strokes in a cycle of said at least a cylinder of said second cylinder group.

34. The method of Claim 29 wherein said adjusting timing of said at least an electromechanical valve for at least a cylinder of said second cylinder group deactivates said at least a cylinder of said second cylinder group.

35. A system for adjusting air-fuel in an internal combustion engine with electromechanical valves, the system comprising:

an internal combustion engine having at least an electromechanical valve in each cylinder;

at least an oxygen sensor and located in an exhaust passage downstream of said each cylinder;

a controller to operating at least an electromechanical valve in each cylinder combusting an air-fuel mixture during a cycle of said cylinder; and

correcting an air and fuel mixture supplied to said each cylinder combusting an air-fuel mixture, based on a desired air-fuel mixture in said each cylinder combusting an air-fuel mixture.

36. A computer readable storage medium having stored data representing instructions executable by a computer to control an internal combustion engine of a vehicle, said storage medium comprising:

instructions for operating at least an electromechanical valve in each cylinder combusting an air-fuel mixture during a cycle of said engine; and

correcting an air and fuel mixture supplied to said each cylinder combusting an air-fuel mixture, based on a desired air-fuel mixture in said each cylinder combusting an air-fuel mixture.